



Professor Audley and the Margaret Thatcher Illusion.

Faces interest psychologists, not only because they show the emotions which people are feeling, but also because there is evidence that the brain contains centres that specialise in processing faces, as distinct from other visual images. Occasionally patients are reported with the rare condition of prosopagnosia, in which despite otherwise normal vision they cannot recognise the faces of people familiar to them; typical of this is a man who had a stroke, could see perfectly well, but did not recognise his wife when she walked into the hospital ward to visit him, though he instantly knew who she was when she spoke. In the past decade a spate of experiments have analysed how we recognise faces, and extract particular sorts of information from them.

The pictures on page 1 illustrate what psychologists now call "The Margaret Thatcher Illusion" (after the face on which it was first demonstrated). If the page is held the right way up, so both faces are upside down, then it is

difficult to tell much about the expressions on the faces; a glance suggests they are similar, but we would be hard pushed to say for certain if the face is smiling, scowling or whatever. That difficulty is confirmed by turning the page upside down, when we see that the expressions are in fact very different; with the faces the right way up it is instantly apparent that while one picture shows the normal benign smiling face of our own illustrious Head of Department, Professor Bob Audley, the other shows a grotesque expression which is better not described any further. The bizarre expression is produced simply by cutting out the eyes and mouth in the original photograph and rotating them through 180 degrees. Why were we unaware of the bizarre expression when viewing the picture upside down?

Such questions can be investigated, as can many other phenomena in vision, by computer manipulation of the images, to find which information is crucial to the illusion. In the four pictures on this page we show the face with the bizarre expression but using only information at a particular scale or size. By Fourier analysis and filtering we have retained

only certain spatial frequencies: the top left hand image contains only very low spatial frequencies, and the one at top right contains low frequencies. In each the identity of the face is clear (and would be immediately recognised by any member of our department) but there is no information about expression. The two lower images contain on the left, just high and on the right, very high, frequencies, and now the bizarre expression is once more apparent. The expression is carried in the high spatial frequencies. A clue to the illusion, therefore, may be that when we view the inverted face image we are more influenced by the low than by the high frequency information. By such experiments we are dissecting the ways in which the very large and complex amounts of information in an image, be it a face or any other scene, is interpreted by the brain. The practical applications of such knowledge are potentially immense, from robotics and artificial intelligence, to specific problems such as better methods of producing Identikit descriptions of faces. It may even tell us something about Professor Audley ...

Chris McManus

Richard Kemp



for Schools and Colleges

“Is it a boy or a girl?”

“What do you want to be when you grow up?”

These are two questions that are very frequently asked about, or directed to, children. There is no doubt that, in our society, the answer to the first question is likely to have very important implications for the answer to the second. A recently published report showed that women make up fewer than 20 percent of Judges, Barristers and Solicitors; only 12 percent of Accountants, Valuers and

Finance Specialists and less than 10 percent of Scientists, Engineers and Technologists. Conversely, fewer than 20 percent of Shop Sales Staff and Assistants; 10 percent of Nurses and 2 percent of Secretaries are men. These differences obviously have dramatic implications for the salaries, responsibility, financial independence and job satisfaction that most men and women achieve. Similar differences are found in schools and Colleges of Further Education where, in 1985, 78 percent of Physics, 71 percent of Maths and 62 percent of Economics A-levels, but only 39 percent of English and 28 percent of Modern Language A-levels were taken by males.

For some time now psychologists have asked whether such differences can be explained by biological factors alone.

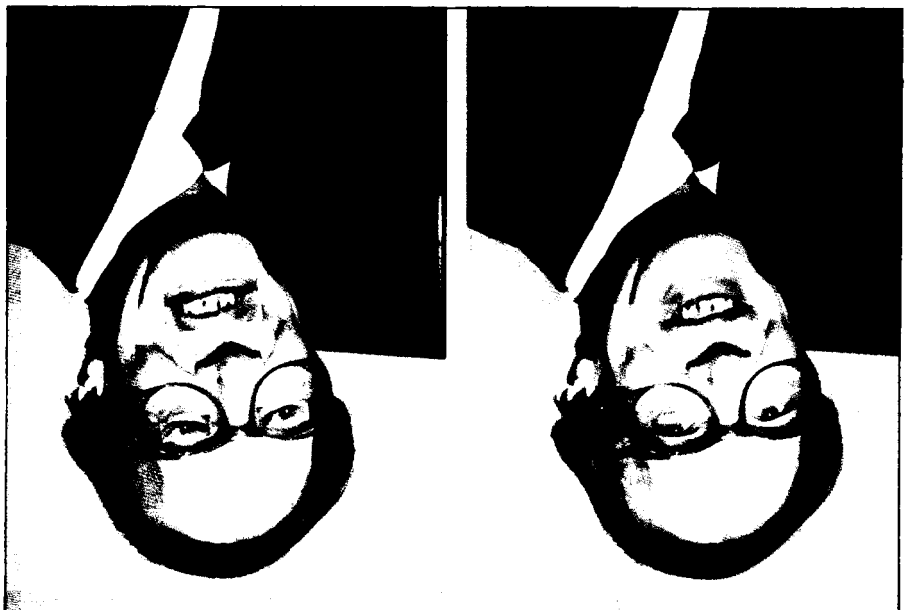
Answers to this have been, and continue to be, hotly debated but social psychologists are currently amassing a large amount of evidence that social forces exert a very strong influence upon the choices that men and women make about their school, higher educational and occupational lives. Parents, peers, teachers and the media bombard us from birth with clearly defined rules about traits and behaviours which are appropriate for males or females. Nearly all of us, at least to some extent, incorporate these notions of active, competitive, analytical males and passive, caring, submissive females in our views of the social world.

As well as documenting these roles, research is currently being carried out at UCL to investigate what effects this “socialisation” has upon people’s

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Take another look at these inverted faces, turn the page upside down and look at them again. See inside on page 7 for an explanation.

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